INTRODUCTION

The use of anthelmintics is widespread in horse production, namely those ones belonging to the Benzimidazole group, due to its lower price and higher safety margins\(^2\). However, the averse of Benzimidazole medications has contributed to a rise of diagnosed cases in vivo and in vitro resistance to these anthelmintics. There is a growing interest in the in vitro action of these molecules, since this kind of laboratory diagnosis tends to replace the in vivo techniques\(^2\). These in vitro data are common in eggs and free larval stages from ruminant trichostrongyles, but seldom seen in horse strongylus free living stages.

OBJECTIVES

Observation of the major changes induced in horse strongylies eggs and larval stages by Benzimidazole anthelmitics and its recording through light microscope and digital photography.

MATERIAL AND METHODS

The observations were performed during routine in vitro research to assess horse strongylus resistance to benzimidazole anthelmitics, performed during June 2004-February 2008, on faecal samples collected from livery horses belonging to Peneda Gerês National Park, Portugal and 22 horses from Romania. For the resistance diagnosis, the in vitro tests of egg hatch assay and larval development assay were used, with different concentrations of Thiabendazole, Mebendazole and Fenbendazole, ranging from 5 to 0.0049 μg/ml. Microphotographs were performed with light microscope and digital camera. The main changes in both eggs and larval stages were recorded.

DISCUSSION AND CONCLUSIONS

These studies have shown the suppression of all processes involving microtubules. As a consequence, successive changes occurred, beginning with the disappearance of cytoplasm microtubules and accumulation of secretions inside the cell caused by incapability of transport and consequent autolysis. The changed metabolism of the larval stages caused deformities in intestinal cells, mainly in the anterior part of the body, the larva being immobile or barely moving and can be attributed to the depletion of the parasites energy reserves, an increase in the use of inner glycogen or a decrease in glycogen synthesis.

RESULTS

During these tests important structural modification of the eggs and larval stages morphology were noticed in the presence of these drugs. At higher concentrations, wall destruction and extrusions of internal contents of egg and first and second larval stages were observed, mainly due to benzimidazole way of action, which have the capacity to block the polymerization of tubulin into microtubules\(^3\). Infective larval stages of horse strongylies showed a diminished motility and the structural architecture of intestinal cells was modified, probably due to the interference of benzimidazole drugs with the glucose metabolism. Morphological and ultrastructural studies indicated a relative fast developing phenomenon, with the initial changes occurring in structures involved in absorption and secretion, probably due to the enzymes accumulated in cytoplasm, which determines autolysis and necrosis of the affected cells\(^4\).

REFERENCES


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